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Title: Moisture Determination		
Revision: 03	Replaces: CLG-MOI.02	Effective: 08/10/2009

Contents

A. INTRODUCTION

1. Theory

   A weighed sample is heated, cooled, and then re-weighed. The weight loss is calculated as moisture content.

2. Applicability

   This procedure is applicable for the determination of moisture in meat, poultry, and processed products.

B. EQUIPMENT

Note: Equivalent apparatus may be substituted.

1. Apparatus

   a. Covered aluminum dishes - 64 mm diameter, 44 mm depth - Catalog No 507-159, Rickly Hydrological Company.

   b. Mechanical convection oven - equipped with a booster heater.

   c. Robot Coupé® food processor - Robot Coupé U.S.A., Inc.

   d. Analytical balance - capable of weighing to 0.1 mg.

   e. Aluminum weighing dish with tab, 57 mm - Catalog No. 25433-008, VWR International.

   f. Aluminum weighing paddles - L-shaped, approximately 25 mm long, 12.5 mm wide.

2. Instrumentation

   None

C. REAGENTS AND SOLUTIONS

1. Reagents

   None

2. Solutions

   None

D. STANDARDS

None

E. SAMPLE PREPARATION

All samples must be processed long enough to produce a homogenous blend of tissue but not so long as to become warm.

F. ANALYTICAL PROCEDURE

1. Accurately weigh 3 to 6 g of sample (representing approximately 2 g of dry material) into a pre-weighed covered aluminum dish with (optional) aluminum weighing dish liner.
   a. Weigh the sample as rapidly as possible to minimize loss of moisture.
   b. The weight of the pan should include the paddle, which is used in spreading the sample across the bottom of the pan, thereby presenting a greater sample surface area, which is beneficial to moisture removal.
   c. If the sample is relatively dry when received, a small quantity of distilled water may be added to the pan only after the sample weight is obtained. This quantity of water will be helpful in spreading the sample across the bottom of the pan, and will introduce no error since it will be evaporated when the sample is oven-dried.
2. Dry, with cover removed, for 16 -18 hours at 100 - 102 °C, or for 4 hours ± 10 minutes at 125 ± 1 °C in a mechanical convection oven. All oven thermometers are calibrated against a NIST thermometer.

   Note: Do not overload the drying oven or sample may be insufficiently dried and give low results. Drying time will start when the original temperature has been reached. Use the oven's booster heater, if the oven is so equipped, to minimize this recovery time.
3. Remove moisture dishes from oven, cover dishes, let cool to room temperature and weigh the tin back.
4. Instrumental Settings

   Not Applicable
5. Sample Chromatograms

   Not Applicable

G. CALCULATIONS

$$\text{Percent} = \frac{100(B - C)}{A}$$

A = sample weight
B = weight of dish + sample prior to drying
C = weight of dish + sample after drying

Note: If laboratory is not air-conditioned, and humidity may present a problem, it is advisable to desiccate dishes prior to the initial and final weighing.

H. SAFETY INFORMATION AND PRECAUTIONS

1. Required Protective Equipment - Safety glasses, laboratory coat, heat-resistant gloves

2. Hazards

   No unusual safety hazards in this method.

3. Disposal Procedures

Procedure Step	*Recommended Safe Procedures*
Disposing of dried meat samples	Dispose of according to local, state, and federal guidelines.

I. QUALITY ASSURANCE PLAN

1. Performance Standard

Analytical Range (%) [1]	Repeatability Standard Deviation (STD)	Reproducibility STD
	< 0.46[2]	< 0.65[2]

[1] Limit may vary due to sample and aliquot sizes and sample type.

[2] One standard deviation based on historical data.

2. Critical Control Points and Specifications

	Record	*Acceptable Control*
a.	Sample size	3 - 6 g (representing about 2 g dry material)
b.	Dish size	≥ 50 mm diameter, ≤ 40 mm deep; with cover.
c.	Oven temperature	101 ± 1 °C for 16 -18 hours or 125 ± 1 °C for 4 hours ± 10 minutes after oven reaches temperature; Mechanical convection, forced-air oven. Check temperature with calibrated thermometer. Calibrate against a NIST thermometer.
d.	Oven loading	No dishes touching and not placed on solid tray; proper air circulation required.
e.	Oven recovery	Return to temperature within 10 minutes from door closing. Check and keep record, once per quarter.

3. Readiness To Perform

a. Familiarization

i. Phase I: Standards- Not Applicable.

ii. Phase II: Fortified samples- Run a set of 5 -10 previously analyzed samples in duplicate. Repeat on two additional days. (Different samples may be used on each day).

iii. Phase III: Check samples for analyst accreditation.

(a) 15 check samples for initial analyst qualification.

(b) Samples submitted by the Quality Assurance Manager (QAM), Accredited Laboratory Program (ALP), or supervisor.

(c) Authorization from the Quality Assurance Manager (QAM) and Supervisor are required to commence official analysis

b. Acceptability criteria.

Refer to section I. 1., Performance Standards

4. Intralaboratory Check Samples

   a. System, minimum contents.

      i. Frequency: 1 per week, per analyst, if samples are analyzed

      ii. Records are maintained by analyst and reviewed by supervisor and Quality Assurance Manager.

   b. Acceptability criteria.

      Refer to section I. 1 Performance Standards

      If unacceptable values are obtained, then:

      i. Stop all official analyses for the analyst.

      ii. Take corrective action.

5. Sample Acceptability and Stability

   a. Matrix: Meat, poultry, and processed products

   b. Condition upon receipt: Unspoiled and sealed from air

   c. Sample storage:

      Time and Condition: 24 months frozen or 1 - 3 weeks refrigerated.

6. Sample Set

   a. Meat recovery

   b. Samples

7. Sensitivity

   Method detection limit (MDL): 0.5 %

J. WORKSHEET

Not Applicable

K. APPENDIX

1. Reference

   Official Methods of Analysis of the Association of Official Analytical Chemists, 15th Edition, 950.46.

L. APPROVALS AND AUTHORITIES

1. Approvals on file.

2. Issuing Authority: Director, Laboratory Quality Assurance Division.